



B.K. BIRLA CENTRE FOR EDUCATION

SARALA BIRLA GROUP OF SCHOOLS
A CBSE DAY-CUM-BOYS' RESIDENTIAL SCHOOL



PRE MID-TERM EXAMINATION

PHYSICS (042)

Class: XI

Date: 06.08.25

Admission no:

Time: 1hr

Max Marks: 25

Roll no:

General Instructions:

- (i) There are three sections A, B, and C with 13 questions in total, Section A has 5 Multiple Choice Questions of one mark each, Section B has 4 questions of two marks each and Section C has 4 questions of three marks each.
- (ii) All questions are compulsory.
- (iii) Calculators are not allowed.

Section A

1. What is the dimension of the physical quantity α in the equation, $P = \text{density}/\alpha$, where P is the pressure? 1
(a) $M L^2 T^{-1}$ (b) $M L^4 T^{-2}$ (c) $L^{-2} T^2$ (d) $M L^{-2} T^2$
2. How many significant numbers are there in 0.00207? 1
(a) 6 (b) 5 (c) 3 (d) 2
3. The displacement of a particle is given by $x = (t-2)^2$ where 'x' is in meters and 't' in seconds. The distance covered by the particle in first 4 seconds is: 1
(a) 4m (b) 8m (c) 12m (d) 16m
4. A lift is coming from 8th floor and is just about to reach 4th floor. Taking ground floor as origin and positive direction upwards for all quantities, which one of the following is correct? 1
(a) $x < 0, v < 0, a > 0$ (b) $x > 0, v < 0, a < 0$ (c) $x > 0, v < 0, a > 0$ (d) $x > 0, v > 0, a < 0$
Directions: Question 5 contain two statements, Assertion and Reason, has four alternative choices, only one of which is the correct answer. You have to select one of the codes (a), (b), (c) and (d) given below.
(a) Assertion is correct, reason is correct; reason is a correct explanation for assertion.
(b) Assertion is correct, reason is correct; reason is not a correct explanation for assertion
(c) Assertion is correct, reason is incorrect
(d) Assertion is incorrect, reason is correct.

5. **Assertion:** A body may be accelerated even when it is moving uniformly. 1
Reason: When direction of motion of the body is changing, the body must have acceleration.

Section-B

6. The photograph of a house occupies an area of 1.75 cm^2 on a 35 mm slide. The slide is projected on to a screen, and the area of the house on the screen is 1.55 m^2 . What is the linear magnification of the projector-screen arrangement? 2
7. A new unit of length is chosen such that the speed of light in vacuum is unity. What is the distance between the Sun and the Earth in terms of the new unit, if light takes 8 min and 20 seconds to cover this distance? 2
8. A car moving along a straight highway with a speed of 126 km h^{-1} is brought to a stop within a distance of 200 m. What is the retardation of the car (assumed uniform), and how long does it take for the car to stop? 2
9. Show that the slope of velocity-time graph of a particle gives the acceleration of the particle at a given time. 2

Section-C

10. Write dimensional formulae of 3
 (i) Angular velocity (ii) Universal Gravitational Constant (G) (iii) Stress
 (iv) Planck's constant (h) (v) Pressure (vi) Kinetic Energy.
11. The frequency ' ν ' of an oscillating drop may depend upon radius ' r ' of the drop, density ' ρ ' of the liquid and surface tension ' S ' of the liquid. Establish an expression for ' ν ', dimensionally. 3
12. On a two-lane road, car A is travelling with a speed of 36 km h^{-1} . Two cars B and C approach car A in opposite directions with a speed of 54 km h^{-1} each. At a certain instant, when the distance AB is equal to AC, both being 1 km, B decides to overtake A before C does. What minimum acceleration of car B is required to avoid an accident? 3
13. (a) Write at least two differences between velocity and speed. 1
 (b) A ball is dropped from a height of 90 m on a floor. At each collision with the floor, the ball loses one tenth of its speed. Plot the speed-time graph of its motion between $t = 0$ to 12 s. 2

---ALL THE BEST---